

Department of Geosciences  
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## Education

- California Institute of Technology, Division of Geological and Planetary Sciences**  
*Ph.D. Geophysics* 2010  
*Dissertation:* Mechanical Models for Interseismic Deformation in Subduction Zones  
Advisor: Prof. Mark Simons  
*Specialization:* Geodynamics, Semi-Analytical & Finite Element Modeling, Inverse theory
- University of Kentucky, Department of Geological Sciences**  
*M.S. Geology* 2003  
*Thesis:* Nonlinear Asperity-Scale Frictional Melting Model.  
Advisors: Prof. Kieran O'Hara (Geol.), Prof. Jim McDonough (Mech. Eng.)  
*Specialization:* Numerical Analysis, Finite Difference Modeling, Fault/Crustal Rheology
- University of Cincinnati, Department of Civil & Environmental Engineering**  
*M.S. Environmental Engineering* 1997  
*Thesis:* A Model for Urban Ozone Dynamics in the Cincinnati Metropolitan Area.  
Advisors: Prof. Pratim Biswas, Prof. Shafiq Islam
- Indian Institute of Technology – Bombay, Department of Mechanical Engineering**  
*B.Tech. Mechanical Engineering* 1994  
*Thesis:* Experimental & Theoretical Study of Horizontal Gas-Liquid Slug Flows.  
Advisor: Prof. Kannan Iyer

## Professional Experience

- Post-doctoral Fellow* **National Taiwan University** Advisor: John Suppe 2010 – Present
- Teaching Assistant* **California Institute of Technology** 2005-2007  
(Field Geophysics, Geodynamics, Inverse Theory)
- Research Assistant* **California Institute of Technology** Advisor: Mark Simons 2004-2010
- Research Assistant* **University of Kentucky** Advisor: Kieran O'Hara 2001-2003
- Teaching Assistant* **University of Cincinnati** (Fluid Mechanics) 1995-1996
- Environmental Engineer* **Science Applications International Corporation** 1997-2002

## Awards and Honors

- Gutenberg Fellowship**, Seismological Laboratory, California Institute of Technology 2003-2004  
Department-wide competitive award given to the best incoming PhD student
- Commonwealth Research Award**, University of Kentucky 2002  
University-wide competitive award by the Dean of Academic Research, for exceptional research presented at a major national conference
- Pirtle Fellowship**, Department of Geological Sciences, University of Kentucky 2001-2003  
Department-wide competitive award given to the best incoming graduate student
- Summer Research Fellowship**, University of Cincinnati 1996  
University-wide competitive award given to outstanding independent research problems

**Research Interests**

Multi-scale dynamics of lithospheric deformation: from the seismic-cycle (duration between characteristic ruptures on a fault,  $\sim 10^2$ - $10^3$  yrs) to tectonic (i.e., orogenic  $\sim 10^6$ - $10^7$  yrs) time scales. 3D/4D numerical modeling of elastic and inelastic (non-recoverable) deformation in the crust and upper mantle, taking into account realistic fault geometries, material/structural heterogeneities, as well as surface modification processes (erosion, sedimentation). Seismic Hazard Estimation: constraining fault as well as bulk crustal rheology over the above time scales, using geodetic, seismic, structural, geochronological and geomorphological data-sets; Regularized or Monte-Carlo/Bayesian inversions. Modeling fault zone processes such as frictional melting and hydrothermal flow. Numerical modeling of ice-flow dynamics and hazards from climate induced alpine glacial cycles.

**Publications & Manuscripts in Review**

**Kanda, R. V. S.**, E. A. Hetland, and M. Simons (2012, *Geoph. J. Intl.*, in review), Asperity model for fault creep and interseismic deformation in northeastern Japan.

**Kanda, R. V. S.**, and M. Simons (2012, *Tectonophysics*, in review), Practical implications of the geometrical sensitivity of Elastic Dislocation models for field geologic surveys.

**Kanda, R. V. S.**, and M. Simons (2010), An elastic plate model for interseismic deformation in subduction zones, *J. Geophys. Res.*, *115*, B03405, doi:10.1029/2009JB006611.

Thomas, W. A., **R. V. S. Kanda**, K. D. O'Hara, D. M. Surlis (2008), Thermal footprint of an eroded thrust sheet in the Southern Appalachian Thrust Belt, Alabama, USA, *Geosphere*, *4*(5), p. 814-818, doi 10.1130/GES00168.1.

**Kanda, R. V. S.**, and D. J. Stevenson (2006), Suction mechanism for iron entrainment into the lower mantle, *Geophys. Res. Lett.*, *33*, L02310, doi:10.1029/2005GL025009.

**Invited Talks**

- Institute of Geological & Nuclear Sciences (GNS-Science), Lower Hutt, New Zealand
- Academia Sinica, Taipei, Taiwan
- National Central University, Jongli, Taiwan
- National Dun-Hua University, Hualien, Taiwan

**Meeting Abstracts (Talks)**

Wu J., J. Suppe, and **R. V. S. Kanda** (2012), Constraints on the extrusion of SE Asia from subducted slabs of the Indian, Australian, Philippine Sea and Molucca Sea plates, Vol. 14, *EGU2012*-10019-1.

Suppe J., J. Wu, **R. V. S. Kanda**, R. Lu, and C. D. J. Lin (2012), New constraints of subducted mantle lithosphere on plate-tectonic reconstructions of deformed continental blocks, Vol. 14, *EGU2012*-7784-1

**Kanda, R. V. S.**, E. A. Hetland, M. Simons (2010), Persistence of Coseismic Rupture Asperities as Inferred from Interseismic Geodetic Observations from Northeastern Japan, *EOS Trans AGU*, *91*(53), Fall Meet. Suppl., Abstract T51F-04.

**Kanda, R. V. S.** and M. Simons (2006), Simple Elastic Dislocation Models for Interpreting Interseismic Deformation in Subduction Zones, *EOS Trans AGU*, *87*(52), Fall Meet. Suppl., Abstract T12C-02.

**Meeting Abstracts (Posters)**

Medina Luna L., S. E. West, L. Bai, E.A. Hetland, J. Ritsema, and **R.V.S. Kanda** (2012), Aftershocks of the 2011 Tohoku-Oki Earthquake and Their Relation to Stresses in the Japan Trench Megathrust Seismic Cycle, *Seism. Soc. Am.* Annual Meeting.

**Kanda, R. V. S.**, John Suppe, Susan M Ellis, Ya-Ju Hsu, Yih-Min Wu (2011), Relative Dynamic Strengths Of Orthogonally Subducting Slabs Under Taiwan, *EOS Trans AGU*, 92, Fall Meet. Suppl., Abstract T51A-2313.

**Kanda, R. V. S.**, and J. Suppe (2011), Dynamics of the Flipping of Subduction under Taiwan, Abstracts, Asia Oceania Geosciences Society 8th Annual Meeting, Taipei, August 8-12, 2011, Abstract ID: SE62-A003

**Kanda, R. V. S.**, E. A. Hetland, M. Simons, S. E. Owen, and F. W. Webb (2008), Can Interseismic Geodetic Observations Resolve Persistent Rupture Asperities? A study of the Japan trench off Tohoku. *EOS Trans AGU*, 89(53), Fall Meet. Suppl., Abstract T23A-1989.

**Kanda, R. V. S.** and D. J. Stevenson (2004), A suction mechanism for iron entrainment from the outer core into the lower mantle, *EOS Trans AGU*, 85(47), Fall Meet. Suppl., Abstract MR43A-0880.

**Kanda, R. V. S.**, and K. O'Hara (2002), Nonlinear Modeling of Frictional Melting at Asperity Tips, *EOS Trans AGU*, 83(47), Fall Meet. Suppl., Abstract S52B-1078.

**Kanda, R. V. S.**, and K. O'Hara (2002), An asperity scale frictional melting model, *GSA Abstracts*, Vol. 34, No. 6, Abstract 42522.

### Teaching Experience

**Division of Geological & Planetary Sciences, Caltech:** *Graduate Teaching Assistant* 2005-07

- **Geodynamics** (*Graduate*), Prof. Mike Gurnis: **Spring, '07**
- **Inverse Theory** (*Graduate*), Prof. Malcolm Sambridge (visiting from ANU): **Winter, '07**
- **Field Geophysics** (*Graduate/Undergraduate*), Profs. Rob Clayton, Mark Simons, Joann Stock: GPS, gravity, magnetic, seismic, and resistivity surveys of Chalfant Valley, E. California, **Spring, '06**
- **Field Geophysics** (*Graduate/Undergraduate*), Prof. Rob Clayton: Developed Matlab-based graphical user interface (GUI) for a seismic refraction code used in field-analysis, to visualize travel-times from assumed 2D velocity structure, **Summer, '05**

**Dept. of Civil & Environmental Eng., Univ. of Cincinnati:** *Graduate Teaching Assistant* 1996

- **Fluid Mechanics** (Hydraulic Systems, *Undergraduate*), Prof Shafiq Islam: **Spring, '96**
- **Aquatic Chemistry** (*Undergraduate*): **Winter '96**

**University of Cincinnati - Educational Services:** *Undergraduate Math/Physics Tutor* 1994-95

**National Social Service Corps (IIT-Bombay):** *Math Tutor for underprivileged children* 1990-91

### Professional Service

**Session co-convener, American Geophysical Union Fall Meeting (T51F/T53C)** 2010  
*Linking Geodetic Observations to Mechanical Properties of the Lithosphere: New Methods & Models*

**Manuscript Reviews** 2006-Present  
*Earth Planets Space (EPS), Seismological Research Letters (SRL)*

### Software Skills

**Numerical Methods:** Numerical Analysis, Finite Element & Finite Difference Methods, Inverse Theory (Linear/non-linear Optimization, Bayesian/Monte-Carlo Methods)

**Scientific Programming:** Fortran 95/90/77, Python (Numpy/Scipy/Matplotlib/VTK), C, HTML

**Software Applications:** Matlab, GMT, Paraview, gOcad, SAC

**Operating Systems:** Unix/Linux/OS-X administration/scripting, Windows XP/7 administration